

FINAL PROJECT
ANALYSIS AND MANUFACTURING COMPOSITE FOR
BRAKE SHOES OF MOTORCYCLE USING WOOD
POWDER, COCONUT SHELL CHARCOAL, AND COPPER
POWDER WITH PHENOLIC MATRIX



Submitted as a Partial fulfillment of The Requirements for Getting Bachelor
Degree of Engineering in Mechanical Engineering Department

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FEBRUARY 2012

DECLARATION OF RESEARCH AUTHENTICITY

I assert verily that the research entitles:

ANALYSIS AND MANUFACTURING COMPOSITE FOR BRAKE SHOES OF MOTORCYCLE USING WOOD POWDER, COCONUT SHELL CHARCOAL, AND COPPER POWDER WITH PHENOLIC MATRIX

That made to fulfill some of requirements to get Bachelor Degree of Engineering in Mechanical Engineering Department of Universitas Muhammadiyah Surakarta, as far as I know is not a plagiarism of a research that has been published, except the information source that to solve the problems.

Surakarta, February 2012
Researcher,

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The Final Project entitles “**Analysis and Manufacturing Composite for Brake Shoes of Motorcycle Using Wood Powder, Coconut Shell Charcoal, and Copper Powder with Phenolic Matrix**” has been approved by supervisors for getting the Bachelor Degree of Engineering in Mechanical Engineering Department of Universitas Muhammadiyah Surakarta.

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DEDICATION

This Research paper is dedicated to:

Allah SWT,

Thanks for the best everything that Allah SWT given for me and thanks for love that always make me to never give up to do the best. I believe that Allah SWT will always give me the best for everything.

My beloved Mother (Suhartini) and Father (Isa Ansori, S.Pd.)

Thanks for your prayer, love, care, support and affection.

You always give me happiness but often I made you disappointed.

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Thanks for your supports.

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As long as I know you, you make me to be focus, spirit, and better.

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Thanks for your prayer, love, support and everything.

All my friends,

Thanks for your supports and love me.

MOTTO

Success is not the aim, but the obligation. (ASF1)

Be not only a success, but useful and valuable. (ASF1)

1. ن وَالْقَلَمِ وَمَا يَسْطُرُونَ

Nun, by pen and what they wrote. (QS. Al-Qalam 1-3)

With faith and morality I'll be strong, without faith and
morality I'll be weak.

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The writer realizes that this research paper is far from being perfect, so the writer sincerely welcomes any constructive comment, criticism, and suggestion from anyone.

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Surakarta, February 2012
The Writer

Asep Sholeh Fakhrol Insan

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ABSTRACT

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Brakes are very important part of the vehicle in supporting aspects of driving safety, brakes should be able to stop the vehicle as quickly as possible, and provide comfort. The objectives of this research was to investigate the influence of the use of wood powder, coconut shell charcoal, and copper powder with phenolic matrix as a material brake Shoes, brake Shoes wear and tear as well as investigating the amount of power needed by the motor when the rotating disc and investigate the resulting hardness.

Research carried out by preparing all the materials and mix with 3 different variations discussed the specified composition. Later in the press with a load 3 tons for 30 minutes and heated with a temperature 120⁰C for 30 minutes. After the specimens were finished later in the test friction force with a weight 15 kg for 30 minutes and measured motor power, brake temperature, disc rotation, and braking time also Brinell hardness test with force 15.625 kg.

Brinell hardness test result generated that violence resulting from brake Shoes Variation 1 has a value of 14.47 BHN and brake Shoes Variation 2 has a value of 14.3 BHN greater than brake Shoes Indopart has a value of 13.7 BHN, while for Variation 3 has a value of 12.6 BHN is smaller than Indopart.

Keywords: *wood powder, copper powder, coconut shell charcoal, brake non-asbestos.*